
Infimum of Paths

Input file: **standard input**
Output file: **standard output**
Time limit: 8 seconds
Memory limit: 256 megabytes

On a directed graph, we use $lex(p)$ to denote the lexical weight of a path p , where the path p can be regarded as a sequence of consecutive edges. The lexical weight is defined by the recurrence relation

$$lex([]) = 0, lex([e_1, e_2, \dots, e_n]) = \frac{w(e_1) + lex([e_2, e_3, \dots, e_n])}{10},$$

where $w(e_1)$ is the weight of edge e_1 , which is an integer between 0 and 9, inclusive.

Given a directed graph, find the infimum of the lexical weights of all paths from node 0 to node 1. The infimum of a set of rational numbers is the greatest rational number that, if exists, is less than or equal to all elements in this set.

Input

The first line of the input gives the number of test cases, T ($1 \leq T \leq 100$). T test cases follow.

For each case, the first line contains two integers, n ($2 \leq n \leq 2000$, $\sum n \leq 20000$) and m ($1 \leq m \leq 4000$, $\sum m \leq 40000$), where n is the number of nodes and m is the number of edges.

Then m lines follow, each of which contains three integers u, v, w ($0 \leq u, v < n$, $0 \leq w \leq 9$), indicating an edge from u to v of weight w .

It is guaranteed that there exists at least one path from node 0 to node 1 for each test case.

Output

For each test case, output one line containing “Case #x: y”, where x is the test case number (starting from 1), and y is the answer modulo $(10^9 + 7)$. More specifically, if the answer can be formed as an irreducible fraction $\frac{A}{B}$, then y will be $(A \cdot B^{-1}) \bmod (10^9 + 7)$.

Example

standard input	standard output
2	Case #1: 241000002
5 5	Case #2: 40404041
0 2 3	
2 3 4	
2 4 1	
3 1 2	
4 1 3	
5 6	
0 1 9	
2 0 6	
3 0 1	
0 3 3	
4 0 3	
4 2 7	

Note

For the first sample, the path corresponding to the infimum is $0 \rightarrow 2 \rightarrow 4 \rightarrow 1$, so the answer is 0.313.